

New information on the status and distribution of the Keel-billed Motmot *Electron carinatum* in Belize, Central America

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La distribución regional del *Electron carinatum* es resumido, con especial atención cuanto al status y distribución en Belize. Son presentadas todas las observaciones en dicho país conocidas por los autores. Importantes poblaciones de *Electron carinatum* están presentes en Chiquibul National Park y la cuenca de río Mullins, con poblaciones más pequeñas en Slate Creek Preserve, Tapir Mountain Nature Reserve y en la cumbre del Mt. Pine. Sus necesidades en cuanto al hábitat y vocalizaciones son discutidas; nuevas informaciones acerca de estos temas están ayudando a delucidar el verdadero status de esta rara especie.

Introduction

The Keel-billed Motmot *Electron carinatum* has always been considered the rarest of its family¹⁷. Found locally in humid lowland and montane forest on the Caribbean slopes (Map 1) of Mexico, Belize, Guatemala, Honduras, Nicaragua, and Costa Rica¹, it has been considered very rare throughout its range⁶. The status of this species in Belize was obscure until the early 1990s. Here we present a comprehensive review of its status within the country, primarily based on new and

unpublished data collected since the publication of Collar *et al.*⁷.

Regional distribution

The Keel-billed Motmot has long been considered rare in Mexico¹ and thought extinct due to habitat loss, with no records since 1952⁷. Historical records are from east of the Isthmus de Tehuantepec; in 1995 one was reported at San Isidro la Gringa during intensive biodiversity surveys in Oaxaca (A. T. Peterson *et. al.* unpubl.



Male Keel-billed Motmot giving territorial call
(Carolyn M. Miller)



Keel-billed Motmot *Electron carinatum*
(Carolyn M. Miller)



Map 1 Historical Keel-billed Motmot distribution

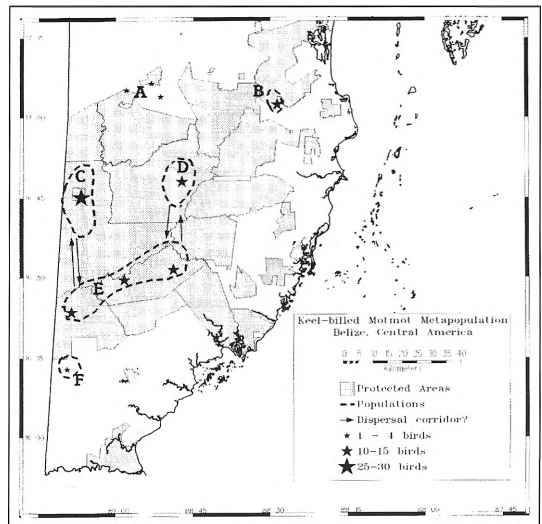
data). There are only a few anecdotal historical records from Guatemala (northern Petén, near the Río Chixoy, and in the east on Cerro San Gil) and few museum specimens. Although a 1958 record exists for Tikal²⁰, there are no other records at this site³ despite intensive recent study in the area by the Peregrine Fund and others. D. Thate (pers. comm. 1994) reported the species along the Río Usumacinta in Guatemala whilst Howell & Webb⁸ also provided recent records for Guatemala (Cerro San Gil) as well as Honduras (Lancetilla). Monroe¹⁶ noted it as uncommon in Honduras and D. Baeppler (*in litt.* 1996) has not recorded the species at Lake Yojoa, a historical collecting site, despite regular observations there since 1989. It has been found along the Río Segovia (Coco) which forms much of the border between Honduras and Nicaragua as well as at other scattered localities. In Costa Rica it is known from just seven localities where, as in eastern Honduras and Nicaragua, it is sympatric with the closely related Broad-billed Motmot *Electron platyrhynchum*, and a mixed pair has been recorded⁷. A specimen, collected since the compilation of the Red Data Book, is held in the national museum of Costa Rica (R. G. Campos *in litt.* 1996). Further, Campos offers corrections to locations (eg. Ciudad Quesada not Villa Quebrada) and concurs with Stiles & Skutch²¹ that Broad-billed and Keel-billed juveniles may be confused and recommends re-examination of specimen records. Regional records are generally limited to single or paired birds although at Cerro San Gil and Lancetilla it was quite common⁸.

Distribution in Belize

Historical records include two 1888 specimens, one from the "vicinity of Belize," the other from San Felipe on the Macal River; a third record is a 1935 specimen from the Cockscomb Mountains⁷. Anecdotal reports also exist from the upper Cockscomb Basin but these remain unsubstantiated. All of Belize's current known populations are south of the Western Highway and of San Ignacio, Cayo District (Map 2). Details of sites and recent observations follow.

Our studies of this species over a four-year period concentrated on a population of 20-25 Keel-billed Motmots at the Maya site, Caracol (6,477 ha), in the Chiquibul National Park (CMM), approximately 50 km south of San Ignacio (C, Map 2). The birds utilised the steep-sided unexcavated Mayan structures as nest burrow sites in subtropical moist broadleaf forest. The Mayan structures have been undergoing active excavation by an archaeological team since 1985. Subsequent modification of the surrounding forest has resulted in the displacement of at least two known pairs of motmots.

Possibly the densest population thus far discovered in Belize occurs within the Mullins River Basin, Stann Creek District¹⁴, an area of steep ter-



Map 2 Keel-billed Motmot metapopulation, Belize, Central America

- A Slate Creek Preserve - Tapir Mountain Nature Reserve - Mountain Pine Ridge
- B Mullins River Basin C Caracol
- D Upper Raspaculo E Southern Maya Mountains
- F Pueblo Viejo Motmot

rain intersected by many seasonal streams (B, Map 2). The motmots apparently utilise the steep banks along such streams for nesting. During a survey in 1994, we estimated 16-20 birds in a 2,000 ha portion of this drainage¹⁵.

In May 1993 we discovered a pair of Keel-billed Motmots in a small valley 12 km south of the Western Highway (Slate Creek Preserve), effectively isolated by surrounding secondary growth and agriculture. A 1994 record exists for the extreme south of Tapir Mountain Nature Reserve (formerly Society Hall), only 8 km from Slate Creek Preserve². R. G. Campos (*in litt.* 1996) noted a single bird calling in broadleaf forest, in a stream-cut ravine in the Mountain Pine Ridge in May 1994. These three disjunct populations are represented by "A" on Map 2. A population exists along the upper Raspaculo River (D, Map 2), an area of high relief, in the Cayo District^{11,12}.

Anecdotal (Matola & Meadows pers. comm.) and published reports^{5,13,18} support the premise that the largest contiguous population in Belize exists in the southern reaches of the Maya Mountains (E, Map 2). Farther south in Toledo District, L. Jones (*in litt.* 1993) reported the species in the forests south of Pueblo Viejo village (F, Map 2). This population is now isolated due to surrounding habitat disturbance but we believe it was once contiguous with the populations of the southern Maya Mountains.

It appears that most known populations are small and, due to habitat fragmentation, many are significantly isolated (Map 2). The Caracol population appears to be separated from the Maya Mountain population but it seems likely that the southern Maya Mountain population is contiguous with that of the upper Raspaculo River. Anecdotal records also exist from the upper Macal River (F. Tzib pers. comm. 1993). The Mullins River Basin and the Slate Creek Preserve/ Tapir Mountain Nature Reserve populations are now isolated due to habitat modification.

Discussion

A better understanding of the distribution and habitat associations of the Keel-billed Motmot is now being reached. Whilst population densities cannot be extrapolated by opportunistic observation (*contra* Meerman and Williams¹³), Keel-billed Motmots can be conspicuous and thus appear deceptively numerous. From January through March they are readily detected as the males are on territory and stridently vocalising. The call is, evidently, very similar to that of the

Broad-billed Motmot⁹. Although we have identified seven distinct calls, the most frequently heard are the far-carrying and occasionally ventriloquial territorial calls which can be described as a drawn-out "kawaa...kawaa". Other distinctive nasal clucking calls noted by Howell & Webb⁹ appear to be limited to paired birds. The often cited description of the call^{19,21} as "a loud far reaching cut-cut-cackock, strikingly like the cackle of a hen..." that Lowery & Dalquest¹⁰ noted, is unfamiliar to us.

Although the majority of Belize's Keel-billed Motmot populations are within existing protected areas, the small population sizes and their relative isolation may be a concern for their long-term survival. In Belize, the species has a patchy distribution (Map 2) and we have observed that some males which remain in relatively small territories are unable to attract mates. In Costa Rica, a mixed pair of Keel-billed and Broad-billed Motmots has been documented, suggesting that there the population is so small that mates are extremely rare⁷. The Keel-billed Motmot is an obligate forest dweller though it may exploit gaps. With large blocks of ideal habitat in the Maya Mountains, it appears likely that Belize has the largest known populations of the Keel-billed Motmot. As a somewhat sedentary bird exhibiting strong site fidelity, it seems unlikely that it would readily disperse across large gaps.

The species is usually quite confiding and when located (most easily by calls) readily observed. We would be most grateful for distributional information from other observers in the region to contribute to the knowledge of this rare motmot as we continue our study on its life history and ecology.

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